

Bucklin (C. A.)

Practical Contributions to

Special Surgery

For the use of Practitioners and Students.

NASAL STENOSIS,

ITS EFFECTS ON THE

Eye, Ear, Pharynx, Larynx, Voice and Brain.

(Reprint "N. Y. Medical Times.")

REPORT AND REMARKS

ON A SERIES OF

TWO HUNDRED CATARACT EXTRACTIONS.

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SYMPATHETIC DISEASES OF THE EYE.

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BY REQUEST of DR. A. L. LOOMIS, who is familiar with my work since 1880, and DR. JAMES R. LEAMING, of this city, I am induced to express my views on nasal stenosis. I cannot allow myself the necessary space to go into the details of my many failures to relief symptoms which are embraced under the elastic term of *nasal catarrh*. I have had an extensive experience with nitrate of silver, galvano-cautery and caustics. Without reviewing my past experience, I desire simply to state the conclusions which twelve years of careful thought, combined with an extensive experience, with *Austrian, German, American and English* specialists in their daily hospital work have forced upon me.

The first conclusion is that specialists, as a class, take an exceedingly narrow view of their special subject. They ignore in practice, if not in theory, the effects of acute infectious disease upon the mucous membranes of the nose, eye, ear, pharynx and larynx.

The second astounding conclusion is that a granular eye-lid may be treated every second day for four years by the best specialists, and the opacity of the cornea resulting from the roughened eye-lid grows worse each day till fingers can no longer be counted at four feet. On the other hand, if the diseased condition of the nasal cavity had been recognized and the disease properly treated, the granular eye-lid could have been practically cured in four weeks. Cases which had obstinately refused to improve while under treatment for four years before the nasal cavity received any treatment, have been practically cured in four weeks after treating the nose.

The third conclusion is, that eighty per cent. of all the persons hopelessly deaf have lost their hearing from catarrhal disease of the middle ear, which was caused by large tonsils, extensive granular masses in the posterior pharynx or a partial or complete stenosis of the nostrils. During the past twenty years specialists have not given these patients treatment which was competent even of arresting this disease, although applied at its earliest stages. They have gloriously neglected to do anything which was of permanent benefit to the patient.

The fourth conclusion is, that diseases of pharynx and larynx, exclusive of infectious diseases and traumatisms, are caused by complete or partial nasal stenosis. The only treatment which can permanently benefit such cases is the complete removal of the nasal obstructions. That nasal stenosis brings about all these results is something which I have been able to demonstrate every day since 1880. I have observed innumerable persons who, notwithstanding the fact that all other kinds of treatment had been patiently tried for years, had never received more than temporary benefit. I frequently meet patients who have been under constant treatment by "spray" every fall, winter, and spring for two, four or six years.

These patients when the nasal stenosis was properly relieved, have received prompt and permanent relief. In only two cases have I been unable to make the results satisfactory to the patients. In no case have I found it impossible to make the result satisfactory to myself. The two cases referred to above were hysterical subjects. One was a female; the other was one of those unfortunate cases in which a female brain occupies the cranium of a male individual. This last subject manifested those perverted sexual instincts usual in such individuals.

The fifth conclusion is, that a person having phthisis has a larynx, trachea, bronchi and lungs, which are more susceptible to the injurious effects of mouth breathing than the

same organs of those who are not phthisical. The nasal obstruction in such cases should be relieved with the greatest possible rapidity. The patient should not be delayed by a lengthy treatment of his nasal or throat trouble, but should be urged to avail himself of the only possible chance of averting the fatal tendencies of his disease by a speedy removal to a more favorable climate.

It causes me to shudder when I observe the frequency with which wealthy persons having phthisis are retained in the city by specialists who delude these unfortunates by allowing them to believe that they are saving their lives by the skillful treatment of their throat affection when the truth is that they are dying by inches. Can these men become so special, and view phthisis from so narrow a standpoint that the encouragement which they give this class of patients is sincere?

How nasal stenosis causes such a variety of troubles will now be considered.

The first condition is where the nasal stenosis is not complete, and the greater part of respiration is carried on through the nose, the mouth remaining closed usually.

Stenosis of this variety admits of a number of forms. The obstruction may be so great at all times as not to admit the air during inspiration with sufficient rapidity to prevent most decided rarefaction in the posterior pharynx, and also obstructs its escape during expiration sufficiently to cause decided compression of the atmosphere contained in the posterior pharynx. It certainly does not require but a legitimate use of reason to conclude that under these circumstances there will be severe chronic congestion of the mucous membranes of the posterior pharynx and larynx, owing to the constant variation above and below the normal pressure of the atmosphere contained within these parts. This chronic congestion causes in time true hypertrophy of the tissues, which, after years, causes the mucous membrane to atrophy. This explains the reason why those who have examined old cases of catarrhal deafness for the purpose of establishing the facts of its dependence upon hypertrophy in the pharynx or obstruction in the nose have failed to demonstrate that such cases have hypertrophy in the pharynx or nasal stenosis.

The hypertrophy existed long enough to produce the damage, but at the time of examination the process had gone further and caused atrophy of the previously hypertrophied membranes. These varying conditions enable those who are so disposed to go into rather extensive classifications of the different forms of catarrh.

The second condition is where the bony stenosis makes the nostril so small that the irritation caused by the slightest change in the weather produces the most annoying symptoms. Such individuals are constantly catching cold in their heads. This amount of hyperæmia in a nostril of proper caliber would occasion no annoyance, as there would be sufficient room for the slight swelling of the mucous membrane without its causing nasal obstruction.

Exostoses and deflections of the bony septum on the one side, and mal-positions of the turbinated bones on the other side, are the causes of bony nasal stenosis.

Large masses of hypertrophied tissue and granulations in the posterior pharynx may interfere directly with nasal respiration, or, like enlarged tonsils, act as foreign bodies in the posterior pharynx and cause a chronic congestion of the mucous membrane of the pharynx.

When stenosis of the nostrils is extreme the individual is known as a mouth breather. Mouth breathers irritate their pharyngeal and laryngeal troubles by inhaling directly into the larynx dry, cold and dusty atmosphere.

How do these conditions effect the eye? Every one has observed that where acute congestion of the nasal mucous membrane exists from either infection or atmospheric changes, the conjunctiva becomes also red, swollen and congested. Admitting that granular lid is an infectious disease, it is usually curable in a few weeks by the intelligent use of sulphate of copper. Occasionally, however, we meet cases of granular lids which are benefited but little, if any, by this treatment, the theory of which is to starve the granulation down by the astringent effect of the copper, and the mild connective tissue changes which its repeated and long-continued application will produce. Cases of this description I find have some radical difficulty in the nasal passages. I believe that the constant irritation communicated to the conjunctiva from the inflamed mucous membrane of the nose through the lachrymal passages explains why it is impossible to treat the trachoma with satisfaction until the nose has received attention. Some may claim the obstructed nasal passages retain the original infectious matter, and are a constant source

of re-infection; to which suggestion there can be no possible objection. The following four cases are selected from many which have taught me to believe in the relations existing between nasal stenosis and granular eye-lids :

Case I.—Mr. L. came to me in 1880. He had been treated for some months by prominent specialists for trachoma. They had tried sulphate of copper and also nitrate of silver. The eyes had been growing steadily worse during the treatment. I tried the same treatment for two weeks, and must confess the eye-lids, which were one mass of granulations, grew steadily worse. The patient told me he had a badly obstructed nose, and every time he caught an additional cold in his head his eyes were decidedly worse. Acting upon this suggestion, without the slightest expectation of success, I thoroughly cleared his nose of all obstructions. In three weeks his granular eye-lids did not annoy him; and I heard within a month that he never has had any return of the trouble.

Case II.—Miss C., a case referred to me by Dr. Fields, of this city, had been treated by skilled specialists every second day for about four years by the usual means of copper and silver. The opacity of the cornea continued to grow worse. She told the same story about the nose being obstructed and the eyes much worse every time she caught cold in her head. At the time I first saw her she could not count fingers at a greater distance than four feet. The opacity of the cornea rapidly disappeared, and after four weeks she refused to come to the office any more because she considered herself well.

Cases III. and IV. were two children treated for three months with sulphate of copper. I found they were not benefited, and removed the nasal obstructions which existed in both children. They improved more in ten days than during the previous three months' treatment. The change for the better was so marked that it attracted the attention of every one who came in contact with the children.

How do these conditions effect the ear? This is probably brought about in two ways; first, by direct extension of the inflammation to the middle ear. The second and more probable way is that the swollen condition of the mucous membrane of the pharynx causes the opening of the eustachian tube to become obstructed in such a manner that the swollen end of the tube acts like a check valve. When we swallow, the air from the middle ear is partially exhausted, and the swollen mouth of the tube is so closed by the vacuum formed in the tympanic cavity that a partial vacuum is constantly maintained within this cavity. It is easy to understand what will happen in the blood vessels of the membranes lining this cavity if they are under a continuous partial vacuum. They will become chronically congested, the lining membrane of the tympanic cavity will hypertrophy, and we very soon have an incurable catarrhal disease in the middle ear. This condition has a tendency to keep up an annoying and unmusical buzz in the ear.

I do not pretend to cure by treating the nose properly an ear which has been destroyed by catarrhal disease; but I do propose to arrest this horrible disease by proper treatment of the nose if the treatment is undertaken before the ear is ruined. The slightest uneasiness or buzz in the ear should seriously attract immediate attention. You have only to look at the text books on otology and to observe cuts of eustachean catheters made to inflate an ear, the eustachean tube of which must be reached from the nostril of the opposite side, owing to a bony obstruction on the affected side, and no other testimony is required in support of the statement that cases of incipient catarrhal congestion of the middle ear do not receive proper treatment. Treatment for catarrhal disease of the middle ear is usually commenced too late to be successful; when it is commenced in time the treatment is of such a nature as to greatly annoy the sufferer without giving him any chance of permanent benefit. The examination of the nasal cavities of school children is of more importance in averting future ear disease than the examination of the eyes is in averting future eye diseases.

How the larynx and pharynx become affected. They become affected in three ways, viz.: by direct extension of the inflammation to these parts, by the rarefaction of air within the parts, and by breathing constantly and directly into the air passages through the mouth colder and drier air, which also contains more foreign substances than the air which is breathed through the nose.

Persons frequently have a distressing cough for years from continual irritation of the larynx, which is greatly improved or disappears altogether upon the restoration of perfect nasal respiration.

The voice.—Singers, both professional and amateur lose their voice as the result of nasal obstruction. Many have the most serious difficulty in attaining a given note—"E," being the note with which the difficulty is most frequently experienced. I have seen such a difficulty which had annoyed a professional singer for twenty years disappear one week after the removal of a bony obstruction from the nostril which had disturbed the normal relations existing between those parts of the sound waves which are emitted through the mouth and nose. Any singer may observe the pure mechanical effects upon the resonance of a head tone by closing both nostrils when producing the tone. Those having the obstruction in the nostril suffer from more than its immediate mechanical effects—they also suffer from the chronic congestion of the mucous surfaces lining the entire respiratory tract, this congestion is directly due to the nasal obstruction, and as a secondary cause, most seriously damages the quality of any musical tone produced by the vocal organs.

How can those conditions affect the brain? Persons suffering from chronic congestion of the mucous surfaces of the nose,, pharynx and sinuses have a full feeling in the head. They are always drowsy, frequently suffer from mental depression, and at times have the most acute headaches. These symptoms are promptly relieved by restoring perfect ventilation through the nose. Having given a passing glance at the etiology of this most common class of diseases we will pass to their treatment.

Treatment.—There is no field in which a greater amount of charlatanism has been practised than in diseases of the nasal passages. The opening in a normal nose between the septum and the turbinated bones is sufficient to admit of considerable swelling of the mucous membranes covering these parts, without causing any annoying obstruction of the nostril.

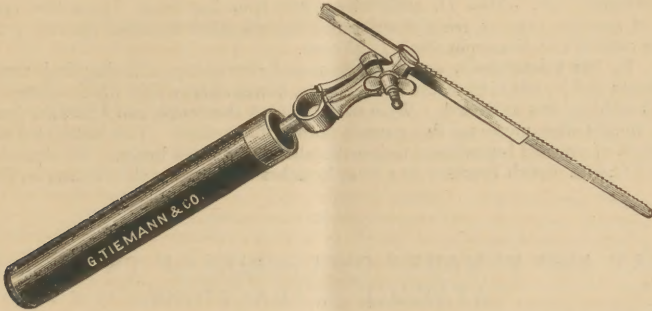
An individual may be thoroughly poisoned by some infectious disease, resulting frequently from defective plumbing, which will cause the swelling of the mucous membranes of the nose to be extreme, and he will have nasal stenosis as a result of excessive hyperemia of the nasal sub-mucous tissues. It certainly shows a great lack of good judgment to attempt to treat such patients with treatment which is exclusively local. They require pure air and such remedies as will most effectually kill bacteria without disturbing the constitution. The fact that a few of these patients have sufficient room between the bony walls of the nostrils to breath well, providing the room occupied by the hyperæmic mucous membrane can be made available, has given rise to innumerable operations and operators who treat all cases by indiscriminate attempts to destroy the hyperæmic mucous membrane with cautery, caustics, scissors, snares, forceps, etc. Beneficial results can be brought about in certain cases by any of these means, provided they are used with intelligence, and their action properly limited. I am, however, convinced that the average practitioner in attempting to make a limited *slough* on the mucous membrane of the turbinated bone, gets the caustic pretty well over the entire lining of the nose, and the adjacent surfaces in these cases become firmly adherent; thus more harm than good results. The treatment of these cases by galvano-cautery has many warm friends. I use it occasionally, but find that it fails, like the spray, to bring about the substantial and permanent results with which I am satisfied. It occasionally gives a result which is highly satisfactory to the patient. My experience, however, is that the results are frequently satisfactory at the time, but they are seldom permanent. Most practitioners have given up galvano-cautery because of the difficulties of keeping a constant supply of electricity on hand sufficient for cautery purposes. I overcame this difficulty by designing a battery which is manufactured by Henry E. Stammers, of this city. It only requires charging and cleaning every two years to furnish sufficient electricity for daily cautery operations in the nose.

I, however discovered, as early as 1880, that in the majority of cases the true cause of the difficulty was a too narrow opening between the bony walls of the nostril. The septum, by its deflections or exostoses, usually so encroaches on the nostril as to make it impossible, by destruction of the soft tissues with cautery or caustics, to obtain permanent satisfactory nasal respiration. Occasionally the malposition of a turbinated bone is the cause of a serious nasal obstruction.

My first attempts to overcome these difficulties were made in 1880, and they were the first thoroughly successful ones ever made. The instrument I used was a No. 10 jeweler's saw, clamped in a sheath of metal to give the saw the requisite stiffness. One and one-half inches of the saw were left free to cut. The metal sheath was firmly clasped

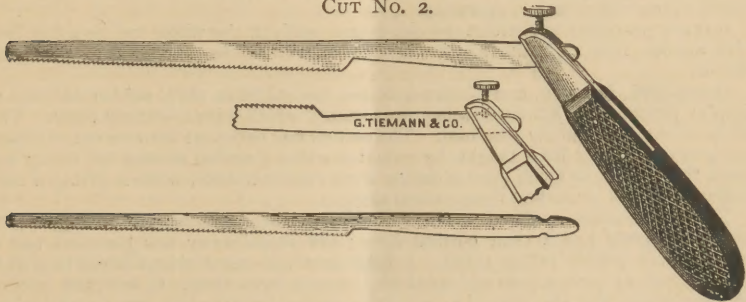
in a pin vice, which was driven into an ebony file handle. Seventy-five cents furnished the instrument complete, with a dozen blades. Although cocaine was not then in use, I obtained some most satisfactory results with this instrument in treating bony obstructions in the anterior parts of the nostril, owing to exostoses or deflections of the septum. I regard this instrument with such classic reverence that I give a cut of it in its original simplicity. Cut No. 1.

CUT NO. 1.



I was not long in discovering bony obstructions in the nostril, which were rather heavy for this little saw, some of them protruding at least one-fourth of an inch into the nostril and having a length of one inch. These difficulties led to the construction of a heavier and longer nasal saw, manufactured by Tiemann & Co., and known as Bucklin's reversible nasal saw. It has two blades which are reversible in the handle.

CUT NO. 2.



Cut No. 2 represents this saw as it is in use at present. With it I can remove from the nose any bony obstruction which is detrimental to perfect nasal respiration.

I am more thoroughly convinced every day that the common trouble in nasal disease is caused by the narrowness of the bony opening in the nostril, which does not permit the mucous membrane to become as hyperæmic as it naturally must, during sudden changes in the atmosphere without producing serious nasal stenosis.

The dental engine is the only instrument which attempts to compete with the saw in increasing the space between the bony walls of the nostrils. The engine is clumsy, expensive, and well calculated to frighten nervous patients. An exostosis from the septum of sufficient size to require one hour's constant work with the dental engine can be dropped into the handkerchief in one minute with the saw.

The operation, by the thorough use of cocaine, is made painless, and gives results which are permanent and thoroughly satisfactory. Dr. Bosworth, of this city, has constructed a saw since I invented my saw, but, as far as I know, did so without any previous knowledge of my instrument. He has done much to demonstrate that perfectly satis-

factory results can be obtained by this method of treatment. He has also been convinced that cautery and caustics in the majority of cases are insufficient and give but temporary relief to the nasal stenosis.

For the removal of granulations and hypertrophies in the posterior pharynx, Jarvis steel wire *écraseur* gives very satisfactory results in most cases. If the instruments are perfectly cleaned and carefully disinfected, there is never any unpleasant reactions following an operation for the removal of a deformity of a septum or a turbinated bone.

Illustrative cases.—Miss D. suffered severely from hay fever. Complete removal of a mass of swollen mucous membrane containing diseased terminal nerves, produced a complete cure of the disease in this special case.

Mr. K. has tuberculosis, cough constant and distressing. Losing flesh rapidly, has night sweats and he has also severe headaches. Nasal obstruction which caused constant mouth breathing was removed. Within five weeks the cough and headache had ceased and his weight also increased five pounds during this period. This illustrates that nasal breathing is of unusual importance to individuals having weak lungs. To change such an individual from a mouth breather to a nose breather is changing the climate he lives in.

REPORT AND REMARKS ON A SERIES OF TWO HUNDRED CATARACT EXTRACTIONS.

THE first hundred of this series were cases which came under my personal observation while following the teachings of Hutchinson, Bowman, Cooper, Bader and Liebreich, of London; Mooren, of Düsseldorf; Rothmund, of Munich; and Arlt, Stellwag, Jaeger, and Mauthner, of Vienna. The second hundred I operated upon myself. I think the accidents which occurred in the first hundred cases were quite as instructive to me as my own subsequent experience in operating.

It is not my object to criticise any one or any method, the whole end aimed at being to demonstrate how accidents happen in cataract extractions, and how to avoid such accidents.

Hutchinson, Bowman, and Cooper were not innovators in 1877, neither did they use antiseptic precautions, although using instruments which were absolutely clean. Their patients were all profoundly etherized. The section was never the extreme cut of Graefe; these operators having been taught by experience that a section so near the ciliary body exposes the patient to much greater danger from cystitic trouble, without giving a corresponding degree of protection from corneal sloughs.

These gentlemen operated much earlier than their continental colleagues; the cataract frequently had a clear cortical layer; the capsulotomy was J-shaped, and the iridectomy was usually rather small. I never saw but one accident at the time of the operation, and my observations embraced fifty cataract extractions. In one case, operated upon by Cooper, the lens turned a complete somersault before presenting in the wound, which accident I believe always to be the result of slight laxation of the lens with the cystotome. This operation was followed by acute iritis and closure of the pupil, good vision being, however, subsequently obtained by iridotomy. In other cases the corners of the iris were frequently caught in the wound, owing to the narrowness of the iridectomy. This fact, taken in connection with the free laceration of the anterior capsule of an unripe cataract, caused iritic processes to be an almost constant complication following the operation; the iritis was, however, mild, and did not in any instance prevent practical vision from being obtained.

I do not think Liebreich's method received the amount of attention that any new operation of apparent practical utility should receive. Neither do I think that his methods would have received the support of many unbiassed operators had they received proper consideration and a fair trial. Some of the results I saw from his operations were truly beautiful; but one, however, resulted in a complete slough of the cornea, and in another the iris became extensively attached to the corneal wound, and a slow grade of iridochoroiditis destroyed the eye.

Liebreich has had very many flattering successes, but, on the other hand, he never could tell when he would have the most discouraging failure, from no other cause than the peculiarity of his operation. His case of corneal sloughing, above mentioned, fell later into Bader's hands, and he did what I never saw intentionally done before. Although the patient was seventy years of age, he made repeated dissections of the lens in the remaining eye, and after several months caused it to absorb sufficiently to give the man practical vision, a slight portion of the nucleus remaining, however, in the centre of the pupil.

The above experiment thoroughly demonstrated to me that it was practical to operate upon cataracts long before they were ripe.

The result of my experience I will give later, in detailing my own operations. Modern ophthalmologists dismiss in a very short manner the inquiries of our antiquated colleagues regarding the success of couching the lens, by declaring that the depressed lens is a foreign body in the eye, which will sooner or later be fatal to vision. They reply by stating that they have seen good and permanent results from couching, which statement I doubted for a long time.

In a conversation with the late Dr. Frank Hamilton, he said, when the results of couching at the time of the operation were satisfactory to him, they were usually, after a time, unsatisfactory to the patient; however, when he sometimes completely failed in displacing the cataract from the pupil, the results at a later period became permanently satisfactory to the patient. In the first instance he displaced the lens into the chamber of the vitreous, where it became a foreign body; in the second, his couching needle crushed through the lens, making an extensive dissection. The lens, as in Bader's case, was gradually absorbed by the aqueous coming extensively in contact with its substance; in this way he certainly did obtain satisfactory and permanent visual improvement. The late Dr. Agnew, of this city, believed that the methods of Liebreich, owing to the prejudice of the profession against the man, never have received a fair trial, and he has given them a trial.

An operation which commanded the respect of an authority so bright and honest as Agnew must still be regarded with hopeful consideration. I think the fact that he had not discarded the operation is the most charitable thing I can say about it.

While London surgeons had few accidents during their cataract extractions, owing to their patients being profoundly under ether, the iritic complications were more numerous and severer than those observed after the operations by Horner, Mooren, or Arlt.

The difference in the severity and number of complications could not be traced to any other causes than the stage of development of the cataract at the time of operation and the extreme delicacy with which they operated.

The accidents during the operations were more numerous among the Germans, owing to the fact that they operated without ether, or without profound etherization. Every accident I ever saw among the German operators could be charged to one of these causes, the latter being much worse than the former.

Cocaine is excellent for all operations except enucleation, iridectomy, and cataract; I am fully convinced of its dangers in the two latter operations.

Many surgeons, however, have to lose an eye of one of their best patients before they can be convinced of the dangers of trusting it.

The German operators learned from experience that the debris left behind from attempting to remove a lens which had a clear cortical layer caused severe iritic reactions. They insisted in removing the iris sufficiently to prevent its corners from becoming entangled in the wound. They tore more frequently than cut the anterior capsule. I think an operator in 1877, who would have had the temerity to remove a lens from the eye, through which fingers could still be counted at four feet, would have found poor support from his colleagues had he been prosecuted for damages. Arlt, of Vienna, would wait for years till the layers of transparent cortex had become opaque. This was at that time the only way of avoiding the injurious effects from debris being left in the eye, thus causing iritic and irido-cyclitic complications, and it cannot be denied that this was very sound practice.

The general introduction of peripheral capsulotomy, for all cases of cataract extractions, by Dr. Knapp, certainly obviates, to a large extent, the objections to having a small amount of cortex remaining.

The experience of Bader demonstrated to me the amount of lens material which

would be absorbed in the eye of an elderly individual. Opening the capsule in such a way as to make a perfect pocket of the empty capsule, and thus allowing the debris from the lens to remain in a closed sac, suggested to me the possibility of operating early.

I have been continually experimenting, and now find no trouble in removing cataracts through which fingers can still be counted distinctly at four feet, and I am able to obtain a perfectly clear pupil without iritic complications.

Dr. Noyes, in his most excellent text-book on diseases of the eye, p. 263, states what has always been impressed upon me by most of the authorities, namely: "It may be premised that qualitative perception of light, that is, ability to see objects or to count fingers—not his own but of another—precludes the idea of operating." I know Dr. Noyes well enough to be sure that he sates only what his experience has taught him.

My experience is, that out of one hundred cataract extractions ninety-six could count my fingers at from two to four feet. Two persons having cataract, who could not count fingers at any distance, lost their eyes from complications following cataract extraction. These failures were caused by accidents resulting from a hypermature condition of the cataract. I have carefully sought for the reason why experience thus far has brought me to a different conclusion than that arrived at by Dr. Noyes, whose experience certainly has been extensive. Under "Cystotomy," p. 246, I think I find an explanation of how our experience differs. He passes a cystotome below the lower pupillary margin, making a clean vertical cut in the anterior capsule. Now, I have made a horizontal peripheral cystotomy, corresponding, as nearly as practicable, to the upper margin of the lens; occasionally, owing to an extra large lens, or a failure of my part to make the opening in the capsule large enough, the capsule has torn in such a direction as to make an opening which was vertical, and extended below the pupillary margin. In every such case iritis followed, and what should be the movable margin of the iris became fastened to the capsule at the point of this vertical rupture.

I certainly should expect mild iritis in all cases where the opening in the capsule is covered by the free margin of the iris, and additional iritis in proportion to the amount of clear cortex existing at the time of the operation. I believe that every thoughtful ophthalmologist will agree that it is impossible, in an eye which has been opened, to make an opening in any portion of the lens capsule, which is covered by the iris, without having adhesions from between it and the lacerated capsule.

The capsulotomy done by Dr. Noyes is ingenious, easily done, and much less likely to be complicated by accidents in hands which are not thoroughly experienced and under perfect control than the peripheral capsulotomy. Dr. Knapp's cystotome, providing it can be maintained in perfect condition, so that there is no point which will not cut clean, is a very excellent instrument. It is, however, so delicate, that the difficulties in keeping it in condition are very great. The chances are that three out of five of the most experienced operators who have not used it before, or are not warned of the tendency one has to overreach, will plunge the point of the instrument through the suspensory ligament, which accident will be followed by vitreous presenting in the wound.

A sickle-shaped cystotome, with a point flat enough to be easily seen in the eye, is more easily kept in order, and is a much safer instrument in most hands than the Knapp cystotome.

The hundred cases which I have operated upon have taught me one lesson. With an empty stomach, profound etherization, absolute cleanliness, an iridectomy sufficiently broad to prevent any possibility of the corners of the iris becoming fast in the wound, and a clean peripheral cut in the capsule, the operation will not be complicated by any accident which is within the control of an operator. The eye will close in four days, without sufficient reaction for the patient to know from his sensations that the cataract has been removed; extensive hemorrhage into the vitreous at the time of the operation, or soon after, from the rupture of a diseased blood-vessel, is an unavoidable accident.

From the two hundred cases of cataract extraction I have seen, not an eye was lost by infection, and but one cornea sloughed, which accident was the result of a Liebreich section. If this number of cases had been treated antiseptically and the same favorable results obtained, it would have been considered as very positive evidence in favor of the antiseptic method of treatment. I believe that antiseptic precautions should be taken advantage or in our attempts to avoid infection, and intend to make use of them in the future, although I must acknowledge that my past experience would seem to show that the

only *bug poison* necessary is absolute cleanliness. Ninety-four of my cases are of no interest to operators, except as to the condition of the eye previous to operation, for without incident worthy of mention I obtained a clear pupil for the passage of light to the retina. Ninety-two of these cases could see a lighted candle at twenty to forty feet in a dark room, and could still count my fingers at from two to four feet. Two of them could not count fingers, neither could they locate the light of a candle at a greater distance than ten feet; these two cases, however, gained sufficient acuteness of distant vision to read the daily papers. The six cases which were complicated are reported in detail, as being the only kind which are instructive.

CASE I.—Could not locate a candle at a greater distance than ten feet. Gave an indefinite history of traumatic cataract. I operated without accident. In four days the eye had closed, and he could not tell from any sensations he experienced that his eye had been operated upon. The vision gained only enabled him to tell light from dark objects, and to find his way through the doors of the house. An examination with the ophthalmoscope now showed the track of a piece of nail which had passed entirely through the eye; delicate cyclitic membranes were seen in all directions, although there was no detachment of the retina. Sympathetic disease had already blinded the fellow-eye. This case had a better field of vision, and a better light-perception than the two cases above mentioned. Still, the discrepancy in the amount of vision gained teaches a very practical lesson.

CASE II.—Operated upon by a noted and thoroughly competent colleague, with severe iritic complications following. I afterward learned that at the time of the operation sympathetic irritation appeared in the fellow-eye. At the time I saw it all symptoms had disappeared, and I was requested to operate on the other eye. The field of vision was good; the operation was performed. It was slightly complicated by his behaving very badly under ether; the iris was wounded in making the section. The operation was, however, completed without loss of vitreous, and I obtained later a clear pupil. The reaction in this case was much milder after the operation than most of the cases seen on the continent in which the final results were favorable. When the pupil cleared up, however, there were delicate cyclitic membranes deep in the vitreous which were the results of previous sympathetic inflammation. The vision gained after some months was practical, and was better in the second eye than in the first, a circumstance which was, however, purely accidental. If another operator should operate on the remaining eye of Case No. I., he will be obliged to record one case where the visual results were not satisfactory. Should his competitor happen to miss two or more such complicated cases, he could present to the world more charming statistics without being a more expert operator.

CASE III.—Old lady, eighty years of age, weight ninety pounds, very feeble. No perception of light in left eye. Operated upon right eye; cataract was hyper-mature. During the extraction of the lens it made a complete revolution, the lower margin presenting at the wound; iritis followed, with closure of the pupil. Good vision was obtained four months later by iridotomy, patient being able to read finest print.

CASE IV.—The operation was without accident or complication; never saw an operation go more smoothly. Opened the eye once after removing speculum, and everything appeared satisfactory. Just before applying the bandage I carefully opened the eye to assure myself that the wound was clear of iris. To my surprise I found the wound so bulging that the lid could not with ease be made to slip over the flap. This case I regarded as one of severe hemorrhage into the vitreous from the rupture of a diseased retinal vessel. A few days later I saw a similar case, through the kindness of Dr. David Webster. I gave it as my opinion that the prognosis was unfavorable in both cases. A slow grade of irido-choroiditis destroyed the eye in both cases. The operation in both instances was without accident, and could not have been done with greater delicacy.

CASE V.—An old lady of eighty-five years of age had hyper-mature cataracts. She could not count fingers, but had a good field of vision. I removed the lens without accident; the lens was filled with calcareous debris. She could see for some time after the operation, but there was a constant deep injection of the blood-vessels about the ciliary region. The eye looked like one having a foreign body lodged in the ciliary body. As months went on the vision was lost by a low grade of irido-cyclitis. I believe that this eye was lost by calcareous deposits taking place in the ciliary region, or calcareous debris dropping from the lens during its extraction.

CASE VI.—Gentleman, seventy years of age. I operated upon his left eye without accident. Six months later operation was performed on his right eye. He took ether badly. After the iridectomy vitreous presented in the wound; the speculum was removed, and profound etherization was obtained. Without using a speculum a careful cystotomy was made, and the lens was delivered without further loss of vitreous. Moderate iritis followed, but at the end of six months he had $\frac{3}{10}$ of normal vision in both eyes. I do not approve of the introduction of a large flat spoon into the eye until all other methods of removing the lens fail. I have never used it myself, but have frequently seen the spoon introduced where I was positive that, had the etherization been carried to the state of profound muscular relaxation, the lens could have been delivered without it. This expedient is said to be a successful means in complicated cases of removing the lens; but those who have introduced spoons into the eye know well that they feel very uneasy about the prospects of that eye. Unfortunately, in every case (six in number) where I have personally witnessed the introduction of a spoon the eye has eventually been lost.

Taking into consideration the possibilities of one operator meeting cases of a complicated nature, of another operator refusing complicated cases, I do not see how the figures regarding the success of one, two, or more hundred cataract extractions show truly the superiority of any operation or operator. I would rather draw a conclusion from the nature of the failures, accidents, and complications which follow an operator's work, than from the tabular results of his successes. Thus one operator may lack expertness, having loss of vitreous with half of his extractions, entanglement of the iris in the corners of the wound in the other half, and make an irregular tear in the capsule in all of this operations, thus giving quite severe inflammatory reactions. Still, he may have the luck not to meet a case with diseased retinal vessels which will rupture spontaneously when the eye is opened, or a case of hyper-mature cataract which has a lens capsule filled with calcareous deposits, or a case of hemorrhagic diathesis which will bleed without end upon the slightest provocation. If it had been my fortune not to have met with these cases, I could have reported one hundred operations without a single failure. If it had been my misfortune to meet ten such complicated cases as those I have described, I would have had ten failures. The judgment against any one having so many failures would be unfavorable, although it might be unjust.

My results I sum up as follows: *Ninety-six could read the daily papers; two, from disease existing behind the cataract, could not read, although the wound healed promptly without inflammatory reaction; two were complete failures, from causes above detailed, and for which the unbiassed scientist can in no way hold operator or operation responsible.*

I have not selected my cases, but have thus far operated upon all cases presenting, irrespective of complications known to exist previous to the operation. The two cases where the light of a candle in a dark room could not be seen at a greater distance than ten feet, were very uncertain in locating the position of the light, and had been advised against an operation by very competent authority, owing to the probable complicated nature of the cataract. While I acknowledge the perfect soundness of the advice, I cannot help calling attention to the instructiveness of the result, namely, vision sufficiently practical to read the daily papers. The prospective question in ophthalmology will be, How shall we treat such cases of cataract where the disease is only sufficiently advanced to prevent the individuals from following their usual vocation? The prospects are not inviting where an attempt is made, after a preliminary iridectomy, to bring sufficient traumatism to bear upon the lens by applying the force through the cornea. Is it better to attempt to remove the cataractous lens at any stage, or to resort to some artificial means to ripen it?

If the lens is to be ripened artificially, shall it be done by doing an iridectomy, and then introducing a delicate, polished instrument into the eye, stroking the anterior surface of the lens directly with its smooth surface? or shall we dilate the pupil, and introduce into the eye a curved needle, the surface of its curve being a polished surface with which the lens may be carefully stroked? or shall we carefully make a small dissection of the lens for the purpose of ripening it? My experience thus far enables me to say that they may still count fingers up to six feet before one is warranted in exposing his patients to the accidents which may follow any attempt to artificially ripen a cataract. It is better, when they cannot count fingers at a greater distance than six feet, to remove the lens and

deal with any subsequent pupillary opacity as occasion requires, after all inflammatory reaction has subsided.

We must look to the experience of the future to decide which of the above methods is preferable.

The lesson taught by the above statistics present as far as possible the conclusions that have been forced upon me. I think they must correspond very closely with the experience of most operators. I regret exceedingly my inability to attach a tabular report of the acuteness of distant vision obtained. The greater part of my operations have been performed in the remote rural districts of the Middle and New England States without any medical assistance or medical attention after the operation. I have usually left the city in a sleeping car Saturday night, driven long distances, over country roads and operated for cataract on Sunday returning to the city in a sleeping car Sunday night. No other visits were made till the family reported that the redness had entirely left the eye when I repeated the above described excursion into the country, prescribed such glasses as I thought would be suitable, made a crucial incision in the capsule with a flat needle and collected the fee, never seeing the patient again. This taken with the fact that during my early experience I never thought it probable that I should publish my experience regarding cataract extractions is the cause of my failure to have collected an accurate report of the exact acuteness of distant vision. I now follow the more luxurious example of my colleagues and insist upon operating upon cataract cases where the attendants and patients are under my constant observation and control.

The practical conclusions to be drawn from the above observations are: A cataract is uncomplicated when light from a candle in a dark room can be discerned at TWENTY FEET and can be located when held above below to the right and the left.

It is ripe enough for removal when the individual with back to the light of a window can no longer count fingers at a greater distance than two or three feet. The counting of fingers at a less distance indicates a higher degree of maturity, a perfectly mature cataract prevents the counting of fingers at any distance. The eye not being tested should always be tightly covered with a handkerchief held in the hand. Simply closing the eye does not answer as they can see light through a closed eye-lid.

SYMPATHETIC DISEASES OF THE EYE.

UNDER the above title I wish to call attention to some facts of the greatest possible importance. Having been brought so frequently face to face with this horrible condition known as sympathetic diseases of the eye, I shudder when I think that the sad fate of the patient is too frequently the result of a failure of some family practitioner or too positive specialist to appreciate the intricate nature of the trouble or the hidden danger which is lurking under a calm exterior. They fail to fully explain and warn the patient of the danger which may follow in time, and complete blindness is the result. The time required from the injury until the other eye is destroyed varies from a few weeks to forty years.

It is impossible to consider in our limited space the entire details of sympathetic disease of the eye. The entanglement of one of the various nerves which run between the coatings of the eye in considerable numbers in a *scar*, or any other constant source of irritation existing in an eye, as *chronic inflammation*, *calcareous deposits*, foreign bodies, scars resulting from a wound, a cataract which is over ripe and has become calcareous may cause the destruction of the eye, the fellow eye, or both eyes. I desire to present only such illustrative cases as will cause the careful to think and the careless to beware. I present the facts as they exist, not with an intention to criticise, but with a pure desire to do the greatest good.

CASE I.—Mrs. B., age 50. In May the right side of the face was covered with an eruption which followed an attack of malaria. The eruption caused a severe burning and itching sensation of the right side of the face, which later became covered with a yellow crust. The line of division, however, between the crust-covered right side of the face and the left side was very sharp. At this stage she consulted a physician who considered the disease acute eczema ("salt rheum") and treated it as such for three months, when one

of the pustules appeared upon the cornea. It ulcerated, the eye ball was perforated by the ulcer, the pupil became extensively attached to the wound, the eye was lost by inflammation which invaded the eye ball, and three months later the other eye was affected by sympathetic disease. The sharp line of division between the affected and healthy side of the face should have attracted the attention of the physician at once, and caused him to recognize the trouble as arising from an inflamed nerve.

This case illustrates the importance of recognizing and properly treating diseases of the fifth nerve. A failure to make a correct diagnosis in this case made a blind woman, when a correct diagnosis would have lead to a favorable termination of the disease.

CASE II.—Mr. M., age 33, was chipping cast iron in 1865, when a piece of the iron or chisel struck him on the margin of the cornea. It made a simple clean wound on the cornea, through which the margin of the iris prolapsed. The eye at the time I saw it looked exactly as if Critchett's operation for displacing the pupil had been carefully performed by a skilled operator. He retained fair vision in the injured eye. He consulted his family physician and several specialists of this city; each and every one of them were enthusiastic in their explanation of their patient's good luck in having a sharp piece of iron strike the eye ball and do so little damage.

The general verdict was: "*It is a very fortunate accident.*"—"The eye is all right."

Let us now observe the consequences and see how unfortunate the accident was, and how fortunate it would have been for the patient had the eye been so mutilated that its immediate removal would have been necessary. All attempts to use his eyes for any length of time fatigued him. His business called him upon the water in 1873, eight years after the accident; he began to see dark clouds pass over the water, or he would observe an undulating appearance of the water which none of his companions could see. It was three months after he first saw these dark shadows before he saw them again.

The periods became more frequent. Within one year from the appearance of these dark shadows, the *uninjured* eye was totally blind, and only sufficient vision remained in the *injured* eye to enable him to read large print with difficulty. No one had considered the injury serious, and no one warned him of the possibility of the other eye being lost by sympathy.

The operation of Critchett's for displacing the pupil has, in many instances, brought about the same sad consequences years after the patient has passed beyond the observation of the surgeon.

CASE III.—Mr. M., struck in 1850 upon the sclera by a sharp piece of steel which perforated the eye but did not enter the ball. It glanced off. The choroid prolapsed through the wound, and, at the time of examination, looked like a black pin head on the white sclera under the conjunctiva.

To show that there is a possibility of every one being mistaken about the consequences which may follow such a simple accident, I casually mention the fact that he repeatedly consulted our most respected authorities on ophthalmology about the black speck on his eye. They assured him that that was a matter not worthy of attention.

In 1873, fifteen years after the accident, his eye began to tire easily—he began to see smoke in the atmosphere, the vision would periodically become obscure—at last the acuteness of vision became permanently obscured. All efforts to use the eyes produced an immediate sensation of fatigue and were disagreeable to him. He was sent to me by an optician to see if glasses would remedy the trouble. Upon observing the choroidal hernia, I suspected a ciliary nerve was implicated. I cut down by way of experiment, and cut the hernia off as close as possible to the wound, from which I freed it as thoroughly as I could. The vision at that time was $\frac{2}{30}$ of normal vision. The strange feature in this case which surprised me as much as it will any of my readers is, that in eight days the vision increased to $\frac{3}{30}$ of normal vision, and all unpleasant symptoms disappeared.

Those who propose to open the eye to introduce magnets or transfix the choroid with needles, should remember that this case illustrates the possibility of doing a damage which may fifteen years later cause both eyes to be lost, although the *original object* for which the magnet or needles were introduced was well accomplished and successful. Such patients cannot be too thoroughly cautioned as to the possibility of danger years afterward, and the symptoms which announce its approach should be carefully described; such as mist before the uninjured eye—dark shadows which appear periodically, flashes of light—great fatigue upon attempting to use the eyes, etc.

CASE IV. illustrates an example of a careful specialist who is thoroughly aware of the danger while treating a child on the expectant plan. The child has a ulcer of the cornea, which sloughs and a large portion of the iris becomes fast in the ulcer. This is followed by severe inflammation within the eye ball for which she is treated, while the other eye is being kept under observation. The mother is told to bring the child back in four weeks, as the inflammation in the injured eye has quieted down. In six weeks she returns with the child, and imagine the mental chill which must pass over one when he looks into the *uninjured* eye, and sees delicate cycloitic membranes stretching entirely across the field of vision. It is too late to enucleate the offending eye—the *child is blind*. There was no warning in the shape of a complaint from the child. There was no decided injection of the eye to attract the attention of the mother or physician.

Specialists are frequently deterred from doing their duty by the outside pressure of parents, friends, physicians, and dishonest or sometimes ignorant "*eye doctors*," who are willing to give a favorable prognosis on no other grounds than a desire to please the family.

I believe, in children upon whom we cannot rely for early information regarding symptoms in the other eye, it is the duty of the specialist to strongly advise the removal of every eye which decidedly endangers its fellow eye.

CASE V.—Mr. R. At age of 20, cataract developed in one eye from unknown cause. At *fifty*, sympathetic irritation appeared in other eye in the form of flashes of light. Enucleation of offending eye arrested further development of disease in uninjured eye. The lens was calcareous, and calcareous deposits were thickly distributed through the ciliary body. There were evidences of an old intra-ocular inflammation with extensive detachment of the retina. The disease not being traumatic was evidently specific.

CASE VI.—Mr. L., struck in the eye with a cow's horn during boyhood. At the age of sixty, the other eye, which had behaved well during this time, is affected sympathetically, the development of which affection is announced by dark shadows followed by flashes of light, and entire loss of the uninjured eye follows.

The last two cases bring us to a practical point regarding cataract extractions.

How often has the following rule been laid down to students of ophthalmology : *Never remove a cataract before it is ripe*. Meaning as long as fingers can be counted.

Never remove a cataract from an eye when it is plain that no visual improvement can be attained, unless the patient desire it done for cosmetic purposes.

Never remove a cataract as long as there is good vision in the other eye.

In all cases of cataract except the congenital variety, the crystalline lens is undergoing progressive atrophy, the vitreous is becoming fluid, and the intra-ocular blood vessels are becoming weak. Calcareous deposits are quite sure to form in the hyper-mature cataract.

It is not better to disregard all these rules and remove the diseased lens at such time as it can be removed with the greatest safety to the patient? A calcareous lens is a dangerous thing to have in an eye, and also a very dangerous lens to remove by the usual method of opening the capsule, the calcareous debris being liable to fall into the eye during the evacuation of the lens.

I have seen both eyes totally lost within ten weeks after such an accident. The operated eye was destroyed by severe intra-ocular inflammation, and the eye not operated upon was destroyed by sympathetic disease.

If it can be seen that a lens is filled with calcareous deposits and it is to be removed, it is better to remove it in its capsule entire. This is a dangerous operation under the most favorable circumstances, and still more liable to cause loss of vitreous and also intra-ocular hemorrhage in cases where the lens has remained in the eye till it filled with calcareous deposits.

Having waited till this stage, one is between two fires ; and it is impossible to judge which is the more dangerous, the chance of dropping calcareous deposits into the eye by the ordinary method of extraction, or the chance of causing intra-ocular hemorrhage or severe inflammation by the violence done the eye in attempting to remove the lens in its capsule. I prefer to remove the lens as soon as they cannot count fingers at a greater distance than two feet. In the majority of cases this avoids all serious complications. The lens comes out easily. There are no calcareous deposits in it. The vitreous and intra-ocular blood vessels are in a healthier state than they ever will be at any subsequent time.

When I see some specialist of experience who is willing to have the lens and capsule *torn* from his own eye, I shall believe that this method of removing the cataract in its capsule has one enthusiastic and honest advocate. I will not do an operation on a patient's eye that I would not ask a colleague to perform on my eye if I were the patient.

Pagenstecher probably made more money than any operator will again by professing always to remove the lens in its capsule; thus completing the entire operation at a single stroke. He drew cataract cases from every city in Germany and Austria. He appeared to advocate the operation very strongly, and from his monograph, one would think that he believed it to be quite as safe as any method of removing cataract. Patients have frequently been seen who were positive in their assurance that Prof P. had removed their cataract with its capsule. Examination showed, however, that the capsule had been opened by the usual method. These cases have caused me to believe that during his extensive experience with this operation, he had some unpleasant experiences which he forgot to publish in connection with his successes.

In iritis, we sometimes see a nodular appearance of the surface of the iris; this is due to circumscribed portions of the iris being so sealed down to the lens that local cavities are formed in which fluid accumulates and lifts the iris, forming an elevated nodule of which there may be several. Such eyes, as visual organs, are of no value; they are almost sure to set up sympathetic disease in the other eye, the only preventive measure against which is enucleation of the eye. If the family do not endorse this operation, let some kind-hearted colleague take the case and also the responsibility. Iridectomy in these cases is of but little value. When the entire margin of the pupil is fast to the lens or cornea, iridectomy is usually all that will be required to make the offending eye safe.

Having illustrated what may happen to those who do not appreciate the dangers which may arise from sympathetic disease of the eye, we will mention two cases which will illustrate what the over zealous specialists do occasionally.

Mrs. C., aged 50, has acute syphilis. Right eye develops plastic iritis with multiple adhesions of the margin of the iris. Four months later, simple plastic iritis breaks out in the left eye. She visits two of our city eye institutions. The pupil of the last affected eye dilates readily under atropine, with one marginal attachment of the iris to the lens. The disease of the second eye is declared sympathetic. The enucleation of the right eye is most urgently insisted upon at both institutions. I freely confess that I am not so bold as to advise the removal of an eye that still has a good visual field, because plastic iritis has broken out in the fellow eye suddenly and without any premonitory symptoms.

The syphilitic eruption being in a most flourishing condition, is it not more judicious to call the iritis of the *second* eye syphilitic, and to treat it energetically as such, rather than enucleate one eye before you are sure that the *enucleation* of the eye will not have a disastrous effect upon the fellow eye which is already in a dangerous and irritable condition? It must also be remembered that such eyes, as a rule, do very well without enucleation.

Mr. R., age 25, had syphilitic iritis of one eye which caused extensive pupillary attachments of the iris to the lens. The pupil appeared blocked with a mass of exudation. Several weeks later, the second eye was attacked with plastic iritis. The advice given by several specialists was to enucleate the bad eye at once. He was treated for syphilis and iritis; at the end of four months the eye with which he could read, was the one the enucleation of which had been strongly advised.

A single adhesion of the iris to the lens is more dangerous than two or more adhesions so situated that the movement of the iris is limited. Such eyes are only to be operated upon when sympathetic irritation appears in the fellow eye, or the attachment of the margin of the iris to the lens becomes complete and water-tight. This condition can only be diagnosed by the pupil becoming sunken or "crater-shaped," thus proving that fluids can no longer escape into the anterior chamber.

Adhesions of the iris to the cornea are more liable to be followed by sympathetic troubles, than adhesions of the iris to the lens.

These few cases, selected from a large number of similar ones met with in the course of my practice, serve to illustrate the folly of too much conservatism when an eye has been lacerated, or a ciliary nerve is being irritated by disease, injury or a foreign body. In such cases, attempts to save the injured eye after symptoms of sympathetic irritation have appeared will invariably result in the loss of both.

